

REMARKS/ARGUMENTS

The claims are 3-5. Claims 1-2 have been canceled in favor of new claim 5 to better define the invention, and claims 3 and 4 have been amended to depend on claim 5 and to improve their form. Support for the claims may be found, inter alia, in the original claims and in the disclosure in the paragraph bridging pages 1-2. The specification has also been amended to insert headings and to affirmatively recite the subject matter set forth in original claims 2-4. Reconsideration is expressly requested.

The Examiner objected to the disclosure as lacking headings and as failing to recite antecedent basis for the subject matter of claims 2, 3 and 4. In response, Applicant has amended the specification to insert headings and to affirmatively recite the subject matter of claims 2, 3 and 4, and Applicants respectfully request that the objection to the disclosure on this basis be withdrawn.

Claims 1-4 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Specifically, the originally filed specification was said not to teach how materials are exchanged and also what materials are exchanged (claim 1, lines 4 and 5), how to fill new material in layer areas where no setting has occurred and where no previous material is removed (claim 1, lines 5-7), how to connect an

uppermost layer with a layer directly below the uppermost layer and also connect an uppermost layer with the layer lying below a second last layer (claim 1, lines 8-11).

In response, Applicant has canceled claim 1 in favor of new claim 5, which, it is respectfully submitted, removes the ambiguities objected to by the Examiner. It is respectfully submitted that one skilled in the art upon reading the specification would understand how to form the various layers, particularly in view of Page 1, last paragraph to Page 2, first paragraph of the disclosure.

Specifically, the specification discusses a production method in which a small amount of light-setting material is held between two plane-parallel plates solely on the basis of the surface tension. One of the two plates is permeable for electromagnetic waves. A three-dimensional model of the object to be generated is stored in a computer, also in layers. Using this three-dimensional layer model, the light-setting liquid between the two plates is now exposed, for example by means of laser light. The liquid sets at the exposed sites, while the liquid remains at the non-exposed sites. After the two plates have been moved apart by a layer thickness, fresh liquid flows in automatically, and the next layer can be exposed and so on.

In the case of the present invention, a structure in which cavities remain is created, with such a layer-by-layer build-up, into which cavities electronic components can be inserted, for example, which are connected by means of tracks that are also produced using a layer-by-layer build-up. For this purpose, it is necessary for unexposed locations in a layer to be freed from the liquid, and a liquid, for example having electrically conductive properties, is now filled into these cavities, which are now empty, and this liquid also covers the layer that has previously set. Then this layer is also exposed, so that now electrically conductive material is set in a former cavity of the first layer, and also in the layer above that. In this way, an electrically conductive track is formed, bit by bit, which rises vertically upward, but can also be conducted horizontally, depending on the exposure of the layer in question.

Instead of the light-setting liquid having electrically conductive properties, other materials can also be provided. Furthermore, of course, hollow conductors, which play a role in microwave technology, can also be built up in this manner.

All of this takes place on a very small scale, so that entire microsystems can be created in this manner.

In summary, it can therefore be said that structures that consist of a "package" of a specific light-setting plastic can be

built up, in which cavities are left during the layer-by-layer build-up, in which electronic components, for example, or even hydraulic components, etc. are embedded. By using light-setting materials having different physical, chemical, or biological properties (for example electrically conductive), electrical connections between the individual components, for example, both in the vertical and in the horizontal direction, can be generated, by means of which energy flows can be transported. However, channels in the vertical and the horizontal direction can also be generated, by means of which volumetric flows can be transported.

Attached are several diagrams to illustrate the sequence of steps of Applicant's method for clarification purposes for the Examiner's consideration.

It is respectfully submitted that one skilled in the art upon reading Applicant's specification would know how to practice the process recited in Applicant's claim 5. Accordingly, it is respectfully submitted that the rejection under 35 U.S.C. § 112, first paragraph, be withdrawn.

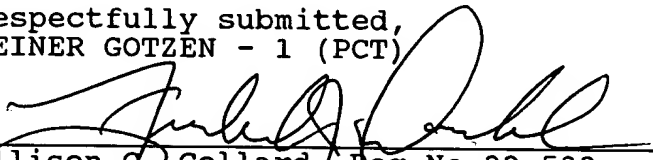
Claims 1-4 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Specifically, claims 1 and 2 were objected as containing more than one sentence. In addition, in claim 1 there was said to be a lack of agreement between the

preamble and the body in that the body did not positively recite formation of three-dimensionally arranged conducting and connecting structures, for using the expression "when the materials are exchanged", for using the expression "also the layer areas...new material as well", and for using the expression "not only the upper most layer...below the second to last layer". In response, Applicant has canceled claims 1 and 2 in favor of new claim 5 which it is respectfully submitted obviates the rejections under 35 U.S.C. § 112. Accordingly, it is respectfully requested that the rejection on the basis of 35 U.S.C. § 112, second paragraph, be withdrawn as well.

In summary, claims 1-2 have been canceled, claims 3-4 have been amended and new claim 5 has been added. The specification and the Abstract have been amended. In view of the foregoing, it is respectfully requested that the claims be allowed and that the application be passed to issue.

Respectfully submitted,
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Enclosure: Exhibit A
Eight (8) sheets of illustrative diagrams

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on November 13, 2003.



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EXHIBIT A

ABSTRACT

The invention relates to a method for ~~poduction~~ production of three-dimensionally arranged conducting and connecting structures for volumetric and energy flows. Various light-setting materials are used for the production of the layers. Upon exchanging the materials, those layer regions in which no setting occurred during the preceding setting process, are also filled with new material, such that, in the subsequent setting process, not only is the upper layer linked to the one lying directly beneath it, but also material of ~~te~~ the upper layer is connected to the material of a layer lying below the penultimate layer. It is thus possible, within the layer sequence, to connect a structure with varying properties from layer to layer.